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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,646	06/08/2000	Vernon M. Williams	4210US (99-0173)	1022

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EXAMINER

MITCHELL, JAMES M

ART UNIT PAPER NUMBER

2813

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/590,646

Applicant(s)

WILLIAMS ET AL.

Examiner

James M. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 3,9,32,38,50 and 54 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-33,35-37,39-53 and 55-69 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1/3/04</u> <u>7/25/02</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is in response to applicant election filed February 13, 2006.

Election/Restrictions

2. Claims 3, 9, 32, 38, 50 and 54 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on February 13, 2006.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 65 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the term chip in "flip chip die" further limits the term die.¹

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

¹ Claim has been interpreted to be simply a flip-chip.

6. Claims 1, 2, 4-8, 12-16, 21-24, 26-31, 33-37, 39, 44, 47-49, 51-53, 55, 56, 64, 65 and 67- 69 are rejected under 35 U.S.C. 102(b) as being anticipated by Subrahmanyam et al. (U.S. 5,411,400).

7. Subrahmanyam (Fig. 1, 8, 9) disclose:

(cl. 1, 22, 26, 27-30, 35, 36, 47, 48, 64, 65, 67, 68) a conductive structure for connecting a contact pad of a semiconductor device/flip-chip/CSP and a contact-pad of a substrate/carrier substrate (e.g. carries chip), comprising: a female member/^{2nd} member (42) configured to be secured to the contact pad (23) of one of the semiconductor device (11) and the substrate (13/22), said female member having: a jacket (e.g., understood to mean any outer surface of a member, e.g. 34) with an aperture/ receptacle (e.g. terminal, 32 inserted in; not labeled) configured to be located over the contact pad; and a conductive center partially filling² said aperture (e.g. member with a recess/aperture with bottom) that with an upper portion of said aperture being open (Fig. 9); and a male member/^{1st} member (32) configured to be secured to the corresponding contact pad of the other of the substrate (22) and the semiconductor device, said male member having: a jacket having an end (e.g. surface of 37) configured complementarily to said upper portion of said aperture of said jacket of said female member (32; Fig. 9), said jacket having an aperture configured to be located

² The partially filling limitations do not further distinguish the prior art from the claimed invention, because the structural features imparted is simply a member that has an aperture with a bottom. Furthermore, the patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

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over the corresponding contact pad; and a conductive center substantially filling said aperture (see footnote 1);

(cl. 2, 52) wherein said aperture of said jacket of said female member (42) is configured to partially limit insertion of said male member thereinto (e.g. bottom & sides of 42 limit; see e.g. Fig. 9);

(cl. 4, 13, 33, 39, 51, 55) the aperture tapers inwardly³ (aperture portion of 39; Fig. 8, 9);

(cl. 5) an outer surface of jacket (37) of said male member is configured to partially limit insertion of said male member into said aperture of said jacket of said female member (Fig. 9);

(cl. 6, 7, 34, 36, 56) wherein said outer surface is tapered (e.g. portion of 37 next to 34) and like a cone so therefore frustoconical;

(cl. 8, 31, 49, 53) wherein said jacket of said male member has an end (e.g. tip of 37 closest to 29) portion with a smaller periphery than a base portion of said jacket (e.g. wide portion of 37; See Fig. 1, top-down view)

(cl 12) said aperture of said jacket of said female member is configured to facilitate alignment of said male member and said female member (Fig. 1);

(cl. 14) wherein an outer surface of said jacket of said male member is configured to facilitate alignment of said male member and said female member (e.g. shape of hole aligned also with shape of jacket (Fig. 1);

(cl. 15) wherein said outer surface tapers outward-from said-end (e.g. tip of 37) to a base portion (e.g. widest portion of 37) thereof;

- (cl 16) and the outer surface (37) is cone shape and therefore frustoconical;
- (cl. 21, 44) wherein at least one of said conductive centers comprises a solder, a metal, or a metal (Col. 2-3, Lines 66-1);
- (cl. 37) wherein an upper portion (e.g. outermost portion of 39) of said aperture has a larger periphery than a base portion of said aperture (e.g. where 29 meets 34);
- (cl. 69) wherein the semiconductor is a semiconductor (Col. 3, Lines 19-20).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 25 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrahmanyam et al. (U.S. 5,411,400) in combination with Abe et al. (U.S. 5,646,442).
10. Subrahmanyam as indicated in paragraph 7 of this office action, discloses the same invention as claimed except that his chip's terminal is cylindrical instead of a BGA, Abe (Fig. 2A, 4) shows that for a socket connection terminals that cylindrical terminals are equivalent to BGA structure known in the art. Therefore, because these two contact structures are art recognized equivalents at the time the invention was made, one of

³ Note, although shown in the prior art, even if the feature were not shown, they still would be considered obvious in light of any standard chip socket (e.g. Kardon, U.S. 5,418,471) since applicant has not disclosed that his claimed shapes are unobvious or otherwise critical. See M.P.E.P 2144.04[R-1]

ordinary skill in the art would have found it obvious to substitute Ball type terminals for cylindrical ones.

11. Claims 10, 11, 17-20, 40-43, 45, 46 and 57-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Subrahmanyam et al. (U.S. 5,411,400).

12. Subrahmanyam discloses the elements stated in paragraph 7 of this office action, but does not disclose the claimed materials⁴ for its female member.

13. However, because applicant has not disclosed that selected material is for any unobvious reasons or otherwise critical the claimed tape materials would have been obvious, since it has been held that to be within the general skill of a worker in the art to select known material on the basis of its suitability for intended use. *In re Leshin*, 125 USPQ 416 (CCPA 1960).

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art shows the general use of sockets/female contacts to connect chips.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

⁴ Examiner recommends that applicant clearly claim that the material is separate and distinct/different from the remaining portion of the female body. Thereby, bringing to light that the jacket and center conductive portion of either the male or female portions are different. This would distinguish applicant's invention over cited prior art.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jmm
July 8, 2006

Carl Whitehead Jr.
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